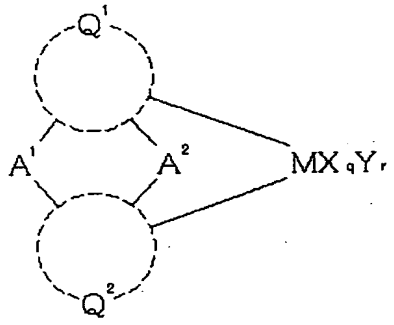
Claims

1. A transition metal compound represented by formula (1),



(1)

wherein M is a metal element of the groups 3 to 10 of the Periodic Table or a lanthanoid;

X represents a ligand having a sigma bond for binding to M, and when X is plural, the Xs may be the same or different;

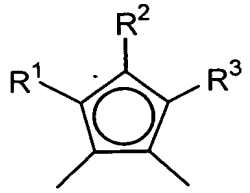
Y represents a Lewis base, and when Y is plural, the Ys may be the same or different;

A^1 and A^2 represent crosslinking groups and at least one thereof has a boron or phosphorous atom as a crosslinking atom;

q is an integer of 1 to 5 and equals [(the valance of M) - 2];

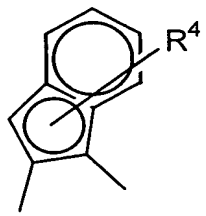
r is an integer of 0 to 3; and

Q^1 and Q^2 have a structure represented by formula (2) or (3), and Q^1 and Q^2 may be different or the same,



(2)

wherein R^1 to R^3 are a hydrogen atom, a halogen atom, a hydrocarbon group with 1 to 20 carbon atoms, a halogen-containing hydrocarbon group with 1 to 4 carbon atoms, a silicon-containing group or a hetero-atom-containing group,



(3)

wherein R^4 is a hydrogen atom or a hydrocarbon group with 1 to 20 carbon atoms.

2. A catalyst for olefin polymerization comprising the transition metal compound (A) according to claim 1.

3. The catalyst for olefin polymerization according to claim 2, further comprising an activating co-catalyst (B), or an activating co-catalyst (B) and an organoaluminum compound (C).

4. The catalyst for olefin polymerization according to claim 3, wherein the activating co-catalyst (B) contains a compound which can react with the component (A) or a compound derived

therefrom to form an ionic complex, a clay, a clay mineral, or an ion-exchange layered compound.

5. A method for producing an olefin polymer comprising homo-polymerizing an olefin, or co-polymerizing an olefin with another olefin and/or another monomer in the presence of the catalyst for olefin polymerization according to any one of claims 2 to 4.

6. An olefin polymer obtainable by the method according to claim 5.